1. (Amended) A substrate processing system, comprising:

a vacuum chamber;

a substrate supporter, located within the vacuum chamber, for holding a substrate;

a gas manifold for introducing process gases into the chamber;

a gas distribution system, coupled to the gas manifold, for distributing the process gases to the gas manifold from gas sources;

a power supply coupled between the substrate supporter and the gas manifold;

a vacuum system for controlling pressure within the vacuum chamber;

a controller, including a computer, for controlling the gas distribution system, the power supply and the vacuum system; and

a memory coupled to the controller comprising a computer **[usable]** readable medium having a computer readable program code embodied therein for directing operation of the substrate processing system, the computer readable program code including:

computer readable program code for causing the gas distribution system to introduce a first process gas comprising a mixture of SiH_4 and N_20 into the chamber to deposit a first plasma enhanced CVD layer over the wafer; and

computer readable program code for causing the gas distribution system to introduce a second process gas comprising He into the chamber to control the deposition rate of the first layer.

2. A substrate processing system as in claim 1 wherein the computer readable program code for causing the gas distribution system to introduce the first process gas comprising a mixture of SiH_4 and N_20 into the chamber controls the introduction of the SiH_4 to be between *5* to 300 sccm, and the rate of N_20 to be between *5* to 300 sccm.

3. A substrate processing system as in claim 2 wherein the computer readable program code for causing the gas distribution system to introduce a second process gas comprising He into the chamber controls the chamber pressure at about 1 to 6 torr.

4. A substrate processing system as in claim 3 wherein the computer readable program code for causing the gas distribution system to introduce the first process gas comprising a mixture of SiH_4 and N_20 into the chamber controls the introduction of the SiH_4 to be at a ratio of between 0.5 to 3 times the amount of N_20.

5. A substrate processing system as in claim 1 further comprising:

computer readable program code for causing the gas distribution system to introduce a third process gas comprising NH_3 into the chamber; and

computer readable program code for causing the gas distribution system to introduce a fourth process gas comprising N_2 into the chamber.

6. A substrate processing system as in claim 5 wherein:

the computer readable program code for causing the gas distribution system to introduce a third process gas comprising NH_3 into the chamber controls the introduction of the NH_3 to be between a rate of 0 to 300 sccm; and

the computer readable program code for causing the gas distribution system to introduce a fourth process gas comprising N_2 into the chamber controls the introduction of the N_2 to be between a rate of 0 to 4000 sccm.

7. A substrate processing system as in claim 1 further comprising computer readable program code for controlling the gas distribution system to operate for a specified time period.

8. A substrate processing system as in claim 7 wherein the computer readable program code for controlling the gas distribution system to operate for a specified time period comprises computer readable program code for causing the first plasma enhanced CVD layer to be formed to a thickness which is an odd multiple, greater than one, of a wavelength of light to be used in a subsequent process operation on the layer.

9. A substrate processing system as in claim 2 wherein the computer readable program code for causing the gas distribution system to introduce the first process gas

comprising a mixture of SiH_4 and N_20 into the chamber controls the introduction of the SiH_4 to be between 15 to 160 sccm, and the rate of N_20 to be between a rate of 15 to 160 sccm.

10. A substrate processing system as in claim 9 further comprising:

computer readable program code for causing the gas distribution system to introduce a third process gas comprising NH_3 into the chamber at a rate of less than 150 sccm; and

computer readable program code for causing the gas distribution system to introduce a fourth process gas comprising N_2 into the chamber at a rate of less than 300 sccm.

44. (New) A substrate processing system, comprising:

a process chamber;

a substrate support, located within the vacuum chamber, for supporting a substrate;

a power supply;

a gas delivery system for delivering process gases into the process chamber;

a controller configured to control the power supply and the gas delivery system; and

a memory coupled to the controller comprising a computer readable medium having a computer readable program embodied therein for directing operation of the substrate processing system, the computer readable program including a first set of computer instructions for controlling the gas delivery system to introduce selected deposition gases into the process chamber at deposited gas flow rates, a second set of computer instructions for controlling the gas delivery system to add a flow of an inert gas to the selected deposition gases at a flow rate previously determined to achieve a desired low deposition rate from a plasma enhanced reaction of the selected deposition gases, the desired low deposition rate being lower than a deposition rate using the selected deposition gases at the deposition gas flow rates with a lower flow rate of the inert gas, and a third set of computer instructions for controlling the power supply to supply power to the process chamber to produce a plasma enhanced reaction of the deposition gases in the process chamber to deposit a film at the low deposition rate.

45. (New) The substrate processing system of claim 44 wherein the inert gas comprises helium.

46. (New) The substrate processing system of claim 44 wherein the selected deposition gases comprise silane and an oxygen source.

47. (New) The substrate processing system of claim 44 wherein the selected deposition gases comprise silane and nitrous oxide.

48. (New) The substrate processing system of claim 44 wherein the selected deposition gases comprise silane and a nitrogen source.

49. (New) The substrate processing system of claim 44 further comprising a vacuum system for controlling pressure within the process chamber, and wherein the computer-readable program further comprises a fourth set of computer instructions for controlling the vacuum system to maintain a chamber pressure in the range of 1-6 Torr, and wherein the selected deposition gases comprise SiH_4 flowed into the chamber at a rate of 5-300 sccm and N_2O flowed into the chamber at a rate of 5-300 sccm.

50. (New) The substrate processing system of claim 49 further comprising a heater for heating the substrate, and wherein the computer-readable program further comprises a fifth set of computer instructions for controlling the heater to heat the substrate to a temperature in the range of 200-400°C.

51. (New) The substrate processing system of claim 50 wherein the substrate support is spaced from the gas distribution system at a distance in the range of 200-600 mils.

52. (New) The substrate processing system of claim 49 wherein the selected deposition gases further comprise NH_3 flowed into the chamber at a rate of less than 300 sccm, and N_2 flowed into the chamber at a rate of less than 4000 sccm.

53. (New) A substrate processing system, comprising:

a process chamber;

a substrate support, located within the vacuum chamber, for supporting a substrate;

an RF power supply;

a heater;

a gas delivery system for delivering process gases into the process chamber;

a controller configured to control the power supply and the gas delivery system; and

a memory coupled to the controller comprising a computer readable medium having a computer readable program embodied therein for directing operation of the substrate processing system, the computer readable program including a first set of computer instructions for controlling the gas delivery system to flow He into the process chamber at a selected flow rate to provide a chamber pressure in the range of 1-6 Torr, a second set of computer instructions for controlling the RF power supply to supply power of 50-500 Watts to the process chamber, a third set of computer instructions for controlling the heater to heat the substrate to a temperature in the range of 200-400°C, a fourth set of computer instructions for controlling the gas delivery system to flow SiH_4 at a flow rate of 5-300 sccm into the process chamber, and a fifth set of computer instructions to flow N_2O at a flow rate of 5-300 sccm into the process chamber, wherein a ratio of the selected flow rate of He to the combined flow rate of SiH_4 and N_2O is at least 6.25:1 to deposit an antireflective layer on the substrate at a deposition rate which is lower than a deposition rate using the same flow rate of SiH_4 and the same flow rate of N_2O with a lower flow rate of He.

54. (New) A substrate processing system, comprising:

a process chamber;

a substrate support, located within the vacuum chamber, for supporting a substrate;

a power supply;

a gas delivery system for delivering process gases into the process chamber;

a controller configured to control the power supply and the gas delivery system; and